

CLAIMS

1. A glass substrate (21) for an information recording medium formed from a disk-shaped glass plate (21a) made of a multi-component glass material containing at least silicon oxide, the glass substrate being characterized in that the glass plate includes a surface layer (27) with an ingredient ratio of silicon oxide that is higher than an inner portion (26) of the glass plate.

2. The glass substrate according to claim 1, characterized in that the surface layer has a thickness of 3 nm or less.

3. The glass substrate according to claim 1 or 2, characterized in that the ingredient ratio of silicon oxide in the surface layer is less than or equal to 1.2 times the ingredient ratio of silicon oxide in the inner portion.

4. The glass substrate according to any one of claims 1 to 3, characterized in that the multi-component glass material contains silicon oxide and at least one of aluminum oxide and alkaline earth metal oxide, and the ingredient ratio of the at least one of aluminum oxide and alkaline earth metal oxide in the surface layer is greater than that of the inner portion.

5. The glass substrate according to any one of claims 1 to 4, characterized in that the glass substrate is disk-shaped and has a surface with a texture including a plurality of projections extending in a circumferential direction of the glass substrate.

6. The glass substrate according to claim 5,

characterized in that the surface has an arithmetic mean roughness (Ra) of 1.5 nm or less, and the plurality of projections have a maximum peak height (Rp) that is 10 nm or less.

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7. A method for manufacturing a glass substrate (21) for an information recording medium, the manufacturing method being characterized by:

10 a first washing step (S14) for washing a surface of a disk-shaped glass plate (21a) with an acid washing liquid, wherein a surface layer (27) is formed on the surface of the glass substrate by the first washing step;

15 a step (S15) for grinding at least part of the surface layer with diamond abrasion grains to remove at least part of the surface layer; and

a second washing step (S16) for washing the surface with a neutral or alkaline washing liquid.

20 8. The manufacturing method according to claim 7, wherein the removing step is performed by grinding the surface layer for a depth of 0.5 nm or more so that the surface layer has a thickness of 3 nm or less.

25 9. The manufacturing method according to claim 7 or 8, wherein the removing step includes scrubbing the surface with a scrub member in a circumferential direction of the glass plate while supplying the surface with diamond abrasion grains.

30 10. The manufacturing method according to any one of claims 7 to 9, wherein the first washing step includes immersing the glass plate in a strong acid solution and then immersing the glass plate in a strong alkaline solution.

11. A method for manufacturing a glass substrate (21) for an information recording medium, the manufacturing method being characterized by:

5 a step (S11, S12) for preparing a disk-shaped glass plate (21a) containing silicon oxide, aluminum oxide, and alkaline earth metal oxide with a uniform chemical composition;

a step (S13) for polishing the glass plate to form a smooth surface (22);

10 a step (S14) for immersing the glass plate in an acid solution to form a surface layer in which the ingredient ratio of at least one of aluminum oxide and alkaline earth metal oxide is decreased;

15 a step (S15) for removing at least part of the surface layer with an abrasive to decrease the thickness of the surface layer to 3 nm or less; and

a step (S16) for uniformly etching the surface layer to a thickness of 3 nm or less while washing off the abrasive with an alkaline washing liquid.

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12. The manufacturing method according to claim 11, wherein the acid solution is a strong acid solution having a pH of 3.0 or less.

25 13. The manufacturing method according to claim 12, wherein the step for forming a surface layer includes immersing the glass plate in the strong acid solution and then immersing the glass plate in a strong alkaline solution having a pH value of 10.5 or less.

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14. The manufacturing method according to claim 11, wherein the step for forming the surface layer includes removing adhered substances that are adhered on the smooth surface.

15. The manufacturing method according to claim 11, wherein the alkaline washing liquid is an alkaline solution having a pH of 11.0 to 13.0.